



Antemortem pulmonary thrombosis as a cause of death in the autopsy During 2015 – 2018

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Abstract

Background: A pulmonary embolism occurs when an embolus, usually a blood clot, blocks the blood flowing through an artery that feeds the lungs. That lead to sudden death.

Objectives: Prevalence of pulmonary embolism as a cause of death in hospitalized and non hospitalized patient that came to forensic medicine after death. To expose of suspected causes and risk factors that lead to death as a result of pulmonary embolism.

Methods: This study done on (211 persons)" dead cases" were collected from(IRAQ – DIYALA-DIYALA HEALTH FORENSIC MEDICINE DEPARTMENT) ,during a period 2015 – 2018.

Results: Prevalence of pulmonary embolism as a cause of death in hospitalized and non hospitalized patient that came to forensic medicine after death was 5.184% .

The percentages of risk factors to PE that lead to death were :

- 1 – Aging (more than 50 years) 28.43%.see (tables 2,3,5,6)
- 2- During or after surgery or minor trauma 23.22%.(see tables 5,6 for this point and other points from(2-11))
- 3- Inflammations 18.48%
- 4 – Over weight 14.21 %
- 5 – smoking 14.21 %
- 6 – Undetected risk factors 8.05 %
- 7 – Medical conditions 8.05 %
(Heart, pulmonary, Liver diseases, Rheumatic arthritis ,Cancerect.)
- 8 - -Hormonal birth control 8.05 %
- 9 – Family history of blood clots 6.63 %
- 10-sitting for long periods 6.16%
- 11 – Pregnancy and postnormal vaginal delivery 2.37 %

12- At extreme cold weather (Nov., Dec., Jan., Feb.) the dead cases were (76) 36% of total (211) cases. Also at extreme hot weather (June , July, Aug., Sep.) ,the dead cases were (85) 40.284% of total cases. (see table 7).

About (161) cases 76.284% dead in Both of extreme weathers

Conclusion: The prevalence of PE (antemortem thrombus) approximately 5.184% in hospitalized and non hospitalized persons, that dead during (4) years (2015-2018).

The highest percentage of dead by PE was Aging group (28.43%) . that may be as a result of overweight, less moving, infections, heart failure, lungs infections and smoking...ect. ;all of these more present in this age group.

The second high percentage was –(During or after surgery or minor trauma 23.22%) that about 1/4 of total number.

This is very important to give care to all post operative or trauma and aware about develop PE specially if the patient has risk factors to blood clots.

Both inflammations cases and medical conditions (26.53%) that predisposed to PE (Heart,pulmonary,Liverdiseases,Rheumatic arthritis ,Cancerect.) should give special care to prevent ,decrease,treat these cases as early as possible against PE.

The most other important factors predispose to PE are "over weight and sitting for long period " represent about 20.37% of total cases .so should do exercices ,walking ,moving and try to decrease over weight. Also prevent and treat bed sore,ulcers,infections. The smoking(14.21 %) is strong risk factor for PE ,so try to decrease ,stop smoking specially to those have another risk factor.

The hormonal birth control(8.05 %)increase risk for PE , so try to use other way for birth control specially if female has other risk factor.

When female become pregnant (2.37 %) should aware about blood clots and DVT.

Any one has family, personal history of DVT, PE (6.63 %) should visit physician to take medical cares and treat, follow up.

After autopsy there are 8.05% of cases with undetected risk factors " this according to our investigations and autopsy.Also there are a lot of dead cases without any history that predisposed to PE.

Keywords: Pulmonary embolism, deep veins thrombosis, Autopsy, clot, Heart failure, Pulmonary infection, surgical operation, overweight.

Introduction

Pulmonary thromboembolism is a major cause of death. The majority of emboli have been demonstrated to originate in the veins of the legs. While other sites of clot origin, such as the atrial appendage of the right heart or the vessel wall at the tip of a venous catheter may be suspected based on the clinical presentation, there remains a group of patients for whom the site of clot origin is an enigma clinically. Rarely considered are thromboemboli arising from the pelvic veins, namely, the periprostatic and paravaginal venous plexuses. The blood clots can be treated with a combination of medical and surgical procedures. The first line of defense is blood-thinning medications, such as Warfarin, which can prevent new clots from forming while the body works to break up existing clots. Aspirin, a blood thinner, is also used. A class of medications called thrombolytics can dissolve clots even more quickly, but can increase the risk of bleeding.

Doctors may also opt to perform surgery to remove the blood clot.

What's to know about pulmonary embolism?
(15,16,17,18,19,20,21)

A pulmonary embolism is a blockage in the pulmonary artery, which supplies the blood to the lungs. It is one of the most common cardiovascular diseases in the United States.

Pulmonary embolism affects around 1 in 1,000 people in the U.S. every year.

The blockage, usually a blood clot, prevents oxygen from reaching the tissues of the lungs. This means it can be life-threatening.

The word "embolism" comes from the Greek *émbolos*, meaning "stopper" or "plug."

In a pulmonary embolism, the embolus, forms in one part of the body, it circulates throughout the blood supply, and then it blocks the blood flowing through a vessel in another part of the body, namely the lungs. An embolus is different from a thrombus, which forms and stays in one place.

Fast facts on pulmonary embolism

Here are some key points about pulmonary embolism.

The risk of pulmonary embolism increases with age

Symptoms include chest pain, dizziness, and rapid breathing

The risk of pulmonary embolism is high for individuals who have had a blood clot in the leg or arm

In rare cases, a pulmonary embolism can be caused by amniotic fluid

Symptoms

Sharp, stabbing pains in the chest may indicate pulmonary embolism.

Symptoms of pulmonary embolism include:

Chest pain, a sharp, stabbing pain that might become worse when breathing in increased or irregular heartbeat, dizziness difficulty catching breath, which may develop either suddenly or over time rapid breathing.

A cough, normally dry but possibly with blood, or blood and mucus.

Severe symptoms call for immediate emergency medical assistance.

More severe cases may result in shock, loss of consciousness, cardiac arrest, and death.

Treatment

Exercise is one of the best ways to prevent pulmonary embolism.

Treatments for embolism aim to:

Stop the clot from growing prevent new clots from forming destroy or remove any existing clot

A first step in treating most embolisms is to treat shock and provide oxygen therapy.

Anticoagulant medications, such as heparin, enoxaparin, or warfarin are usually given to help thin the blood and prevent further clotting.

Clot-busting drugs called thrombolytics may also be administered. However, but these carry a high risk of excessive bleeding. Thrombolytics include Activase, Retavase, and Eminase.

If the patient has low blood pressure, dopamine may be given to increase pressure.

The patient will normally have to take medications regularly for an indefinite amount of time, usually at least 3 months.

Prevention

A number of measures can reduce the risk of a pulmonary embolism.

A high-risk patient may use anticoagulant drugs such as heparin or warfarin.

Compression of the legs is possible, using anti-embolism compression stockings or pneumatic compression. An inflatable sleeve, glove, or boot holds the affected area and increases pressure when required.

Compression methods prevent blood clots by forcing blood into deep veins and reducing the amount of pooled blood.

Other ways to decrease the risk include physical activity, regular exercise, a healthy diet, and giving up or avoiding smoking tobacco.

Causes

A blood clot typically forms in the arm or leg, eventually managing to break free, traveling through the circulatory system.

A pulmonary embolism occurs when an embolus, usually a blood clot, blocks the blood flowing through an artery that feeds the lungs.

A blood clot may start in an arm or leg, known as deep venous thrombosis (DVT).

After that, it breaks free and travels through the circulatory system towards the lungs. There, it is too large to pass through the small vessels, so it forms a blockage.

This blockage stops blood from flowing into a part of the lung. This causes the affected section of the lung to die through lack of oxygen.

Rarely, a pulmonary embolism can result from an embolus that is formed from fat droplets, amniotic fluid, or some other particle that enters the bloodstream.

Diagnosis

To reach a diagnosis, the doctor will look at the patient's history and consider whether an embolism is likely. They will carry out a physical examination. Diagnosis can be challenging because other conditions have similar symptoms.

Tests for diagnosing pulmonary embolism include:

electrocardiogram (EKG), to record the electrical activity of the heart arterial blood gas study, to measure oxygen, carbon dioxide, and other gases in the blood chest X-rays, to generate a picture of the heart, lungs, and other internal organs pulmonary V/Q scan, two tests that analyze the ventilation and structural properties of the lungs computerized tomography (CT) scan, which can reveal abnormalities in the chest, brain, and other organs ultrasound of the legs, to measure the speed of blood flow velocity and any changes d-Dimer test, a blood test that can diagnose thrombosis.

Pulmonary angiogram, to reveal blood clots in the lungs magnetic resonance imaging (MRI), to obtain detailed pictures of internal structures.

Risk factors

The risk of developing a pulmonary embolism increases with age. People who have conditions or diseases that increase the risk of blood clotting are more likely to develop pulmonary embolisms.

A person has a higher risk of pulmonary embolism if they have, or have had a blood clot in the leg or arm (DVT), or if they have had a pulmonary embolism in the past.

Long periods of bed rest or inactivity increase the risk of DVT and, therefore, increase the risk of pulmonary embolism. This could be a long flight or car ride.

When we do not move much, our blood pools in the lower parts of our body. If blood is moving around less than normal, a blood clot is more likely to form.

Damaged blood vessels also increase the risk. This can occur because of injury or surgery. If a blood vessel is damaged, the inside of the blood vessel may become narrower, increasing the chances of a blood clot forming.

Other factor risk include certain cancers, inflammatory bowel disease, obesity, pacemakers, catheters in the veins, pregnancy, estrogen supplements, a family history of blood clots, and smoking.

Outlook

With effective and timely treatment, most people who experience a pulmonary embolism can make a full recovery.

The condition carries a high risk of fatality. However, early treatment can dramatically reduce this risk.

The period of highest risk is in this hours after the embolism first occurs. The outlook is also worse if the embolism was caused by an underlying condition, such as a type of cancer. However, most people with pulmonary embolism can make a full recovery.

Risk Factors For Blood Clot

1-Obesity (23)

Obesity has more than doubled since 1980 worldwide. The number of deep-vein clots is rising right along with that.

Doctors aren't yet sure exactly why, but people who have a body mass index of at least 30 are more likely than people of normal weight to get a blood clot deep in a vein, called deep vein thrombosis, or DVT.

What Causes It?

People who are obese tend to have a less active lifestyle. Being idle makes your blood flow sluggish, and this makes clots more likely.

Extra fat around your belly will also stop blood from moving easily through the deep veins.

Obesity changes the chemical makeup of blood, and it leads to inflammation. Both make your blood more prone to clotting.

And obesity puts you at risk for diabetes, which boosts your chances for getting DVT, too.

What You Can Do

Studies show that losing weight can change your blood chemistry and lower your risks. Overweight and obese adults who did moderately intense aerobic exercise improved their blood health, even if they didn't lose weight.

Unfortunately, it doesn't look like you can lower the risk of a second DVT by losing weight after you've had one.

A lot of fish with omega-3 fatty acids in your diet may help protect your blood against abnormal clotting. Avoid high-carb diets -- they can make your blood more likely to clot.

Your doctor can and should help you get from obese to a healthy weight.

2 - Blood Clots During Pregnancy (13)

Blood clots are serious concerns and even more so while you are pregnant. A blood clot during pregnancy has additional risks or concerns because of your developing baby. The good news is blood clots during pregnancy are rare and there is little need for concern.

However, there are steps you can take to further minimize your risk of experiencing them while you are pregnant.

What is a Blood Clot?

A blood clot occurs when your body sends cells, called platelets, to block the flow of blood. Normally, this occurs when you have a cut, to keep the injury from bleeding continuously. During pregnancy, your blood is more likely to clot as a safeguard against losing too much blood during labor.

However, a condition known as deep-vein thrombosis (DVT), which happens when blood clots form in the legs and pelvic region, can occur and is linked with a number of serious health concerns. The good news is there are ways to both prevent DVT and to treat it after it occurs.

Also, blood clots affect only 1 or 2 pregnant women out of every 1,000, so there is no need for alarm, unless you feel you may be at risk.

What are the Causes of Blood Clots during Pregnancy?

Research has shown a number of possible causes of DVT, and it is important to note whether you fall into any of these categories. Women are most likely to experience a blood clot in their first three months of pregnancy or in the first six weeks after giving birth. If you believe you may be at risk for DVT, be sure to talk to your healthcare provider.

You could be at risk if:

- You or a close relative have experienced DVT before
- You smoke or are exposed to secondhand smoke frequently
- You are over 35 years old
- You are overweight
- You travel long distances while pregnant
- You are expecting multiples
- You are sedentary for long periods of time
- You have a Cesarean section

What are the Signs of Blood Clots during Pregnancy?

Women tend to be more sensitive and aware of potential complications while they are pregnant. Although blood clots are unlikely, there are a few signs that can indicate the possibility of a blood clot.

These include:

- Swelling or pain in one leg
- Pain that worsens when you walk
- Veins that look larger than normal
- What are the Risks of Blood Clots during Pregnancy?
- DVT can seriously affect your pregnancy in a number of ways:
 - Blood clots in the placenta
 - Heart attack
 - Stroke
 - Pulmonary embolism, which is when blood clots break off and are lodged in the lungs
 - Miscarriage

How can you prevent and Treat Blood Clots during Pregnancy?

Prevention of DVT is important, and can be achieved by a healthy lifestyle. Staying active is a crucial component in combating DVT, so check with your

healthcare provider to see which activities and types of exercises you can do. Regular exercise improves circulation and can keep clots from forming. It is also important to eat healthily, and if you are currently smoking, you should stop immediately. It is important to notify your healthcare provider, if you feel you may be at risk of DVT.

If you have been diagnosed with DVT, you will most likely be treated with an anticoagulant, which hinders the blood from clotting as easily.

3 - SMOKING AND BLOOD CLOT (22)

Eighteen medical students who were not smokers were asked to smoke a cigarette, inhaling as much as possible. Blood samples were obtained before and 5 minutes after smoking. A significant increase was observed in platelet adhesiveness. Whole blood coagulation time, recalcified plasma coagulation time, platelet count, partial thromboplastin time, thromboplastin generation time, and tensile strength of the clot showed changes compatible with increased coagulability; however, these were statistically not significant.

Also heavy smoking lead to increase haemoglobin more than normal(hypoxia activate of bone marrow to give more RBC to circulation) ,this lead to sluggish blood flow and more clot occur .

4 - Sitting for long periods doubles risk of blood clots in the lungs(14) person who sit for long periods of time everyday are two to three times more likely to develop a life-threatening blood clot in their lungs than more active person.

The new study is the first to prove that a sedentary lifestyle increases your risk of developing a pulmonary embolism -- a common cause of heart disease.

While other studies have explored the relationship between physical activity and pulmonary embolism, condition with physical inactivity.

They found that the risk of pulmonary embolism is more than two times higher in women who spend most time sitting (more than 41 hours a week outside of work) compared with those who spend least time sitting (less than 10 hours a week outside of work).

The results remained conclusive after taking account of factors such as age, body mass index and smoking,

adding to the evidence that physical inactivity is a major cause of this condition.

The study also shows that physical inactivity correlated with heart disease and hypertension and could be one of the hidden mechanisms that link arterial disease and venous disease.

5 - Hormonal Birth Control and Blood Clot Risk

Combined hormonal contraception (CHC) methods are birth control methods containing the hormones estrogen and progestin. Tens of millions of people safely use CHCs—including birth control pills(8), patches, and vaginal rings—to help space births and prevent unintended pregnancy.

All CHCs carry a small, increased risk of blood clots, though this risk is significantly smaller than the risk of blood clot associated with pregnancy. Venous blood clots—also known as venous thromboembolisms (VTEs)—are a mass of thickened blood inside a person's vein. They can travel through the bloodstream, potentially resulting in damage to vital organs or death.

While all CHCs carry some risk of blood clots, that risk can differ based on the method. the increased risk of blood clots should speak with their health care provider or pharmacist about their risk as well as their contraceptive options.

Why does combined hormonal contraception increase blood clot risk?

Increased estrogen levels are associated with increased blood clot risk. Taking CHCs increases the body's estrogen levels and estrogen increases the blood's ability to clot. Therefore, CHCs increase the risk of developing a blood clot.

In addition to estrogen, some studies suggest that the progestin hormones drospirenone and desogestrel may also increase the blood's ability to clot. These progestins are used in some CHCs such as Yaz®, Yasmin®, and Desogen®. In 2011, the NWHN argued against continued FDA approval of drospirenone pills arguing that they may heighten the risk of blood clots without providing a unique benefit over other available options. The science behind the risk of blood clots with these progestins is still emerging, and people concerned about the possible increased risk should speak with their health care provider.

Do some combined hormonal contraceptive methods have a higher blood clot risk than others?

Research indicates that both the patch and vaginal ring have a higher risk of blood clots than most pills. One study found that people using the vaginal ring were 1.9 times more likely to experience a blood clot than people taking combination birth control pills. In this same study, people using the patch were 2.3 times more likely to experience a blood clot than people taking combination birth control pills.

How often do blood clots occur?

Blood clots are generally rare but sometimes occur in otherwise healthy people, even those not taking CHCs. Between 1 and 5 of every 10,000 women (who are not pregnant and not using CHCs) will experience a blood clot in any given year(9). This number increases slightly if the person uses CHCs. Between 3 and 9 of every 10,000 CHC users will experience a blood clot in any given year (10).

However, the highest risk of blood clots for reproductive-aged women occurs during pregnancy and after giving birth (the postpartum period). This is because women's estrogen levels increase during this time. Between 5 and 20 of every 10,000 pregnant women, and 40 to 65 of every 10,000 postpartum women, will experience a blood clot in any given year(11). So even though CHCs increase the risk of blood clots for its users, this risk is only slightly higher than for non-users and significantly less than the risk associated with pregnancy.

Individuals with characteristics that place them at higher risk of experiencing blood clots are encouraged to discuss the risks of using CHCs with their health care provider or pharmacist.

What contraceptive options are available for people with an increased risk of blood clots?

People with an increased risk of blood clots have other contraceptive options from which to choose. In fact, the most effective contraception does not contain estrogen and is not associated with a higher risk of blood clots, although each has its own unique benefits and risks to consider. These methods include the arm implant (Nexplanon®) and intrauterine devices (IUDs), such as ParaGard®, Mirena®, Skyla®, and Liletta®. The Depo Provera® shot, progestin-only pills, condoms, and diaphragms are also estrogen-free

and safe to use for those with a high risk of blood clots. It should be noted that emergency contraception (Plan B®, or the “morning after” pill) does not contain estrogen and therefore does not increase one's risk of blood clot.

Should combined hormonal contraception be taken off the market?

CHCs carry very little risk for most people—in fact, they are one of the most studied and safest medications available today. The pill, patch, and vaginal ring each meet a unique need, so it's important that a broad range of methods are available. While both the patch and vaginal ring expose users to higher doses of hormones than pills, eliminating the need to take a daily pill may be worth the small increased risk for some.

Contraceptive users need complete information about the risks and benefits of each contraceptive method to determine which method, or combination of methods, is best for them. Individuals are encouraged to discuss the risks and benefits of different contraception options with a qualified health care provider or pharmacist.

6- Blood Clots During and After Surgery(24)

Blood clots are a serious complication that surgery patients can experience during and after the procedure. While a blood clot that forms in the leg is a serious condition, blood clots can quickly become life-threatening conditions if they move to the brain (embolic/ischemic stroke) or the lungs (pulmonary embolism). These complications are very serious and must be treated quickly to minimize the damage caused to the body or the brain.

What Causes Blood Clots After Surgery?

A blood clot is more likely to form during or after surgery than it is during your routine day to day life. There are multiple reasons for this, but one major cause is lying still on the operating table for an extended period of time. This inactivity makes it easier for blood to clot because you aren't moving blood through your body as quickly or as forcefully as you typically during your procedure.

Some people are inactive after their surgery because they are in pain, very sick, or unable to walk. For these patients, the risk of clot formation is increased after

the procedure has finished as well as during surgery because they continue to be inactive.

The type of surgery you are having can also increase the risk of having blood clots after the procedure. If your surgery requires your arteries or veins to be cut or repaired, the risk of a blood clot is higher because your body works to stop bleeding by forming clots. If you are having a surgery where your heart is stopped, typically a heart bypass surgery (CABG), your risk of a blood clot is also increased.

Your own personal medical and social history may also contribute to clot formation after surgery. For example, if you are a smoker you are at higher risk for the formation of blood clots than the average individual, even without having surgery.

Risk Factors for Blood Clots After Surgery

Atrial fibrillation: patients with an irregular heartbeat have an increased risk of forming blood clots.

Pregnancy: the chance of blood clots increases as the body makes blood clot faster in preparation for childbirth.

Cancer: some types of cancer make blood clot more easily.

History of blood clots: if you have had a blood clot in the past, you are more likely to have one in the future.

Family history of blood clots: if there are multiple people in your family who have experienced blood clots, you may have an inherited tendency to form clots more easily than the average person.

Hormone Replacement Therapy (HRT): one known side effect of HRT is the increased risk of forming blood clots.

Smoking: quitting smoking will reduce your risk of forming blood clots after surgery or during your normal day to day life.

Obesity

Prolonged Immobility: this includes the time spent under anesthesia and time recovering if you are unable to walk and return to some normal activities.

Heart valve issues: people with replacement heart valves or heart valve problems have a higher risk of forming clots that can then travel to the lungs or brain.

Dehydration: water is a large component of blood and when there isn't enough the blood can clot more easily. Drinking adequate water after surgery can help prevent clots from forming.

Genetics: If your immediate family is prone to forming clots, you may be as well.

Preventing Blood Clots After Surgery

Getting up and moving during your recovery from surgery is one of the best ways to prevent blood clots. Staying well hydrated by drinking ample amounts of water can also reduce your risk of forming clots. You should also know the signs and symptoms of a blood clot.

In addition to these simple measures, your doctor may also prescribe medication to prevent clots from forming. As always, prevention is better than treatment. Injectable medications—such as Lovenox or Heparin—are very common during a hospital stay after surgery, this medication is given to prevent the formation of a blood clot. It is less commonly prescribed for use at home.

Treatments for Blood Clots

The treatment for blood clots depends on the location of the blood clot. If a clot does form, there are treatments that can be done. Coumadin, or the generic warfarin, is given to help the body remove a clot from the bloodstream. Heparin may also be given to prevent additional clots from forming or to prevent clots from growing in size.

A clot that travels to the blood vessels that feed the brain can cause an ischemic stroke, also known as an embolic stroke. This type of stroke causes damage by depriving the tissue fed by the blocked blood vessel of oxygen.

This type of stroke is treated by a medication called TPA that helps dissolve the blood clot. If TPA cannot be used or is not effective, doctors may choose to attempt to remove the clot surgically. This procedure is done by threading a tiny instrument into the bloodstream through a tiny incision in the groin. The device is slowly moved through the blood vessels of the body until the clot is reached in the brain, where it can be gently removed and withdrawn from the body through the groin incision. Once the clot is removed, blood can again flow to the tissues of the brain

deprived of oxygen, and the patient may recover some of the function of that area of the brain.

Clots that form in the legs are called deep vein thrombosis (DVT) and are the most common type of blood clot after surgery. They have a variety of causes and typically remain in the legs, but can break free and begin to move through the bloodstream. Clots can move from the legs to the lungs and cause a life-threatening condition called a pulmonary embolism. While a pulmonary embolism can be treated, there is a high mortality rate associated with this type of blood clot.

Typically, clots in the legs are treated with medication, but in cases where there is a high risk of the clot moving to the lungs, a device called an inferior vena cava filter (or Greenfield Filter) may be placed. This device acts as a tiny basket, catching clots before they can lodge in the lungs and cause damage. These filters are placed through a small incision in the groin or neck, through which the filter is threaded into place in the inferior vena cava. The filter may be placed temporarily or permanently.

A Word From Very well

Blood clots after surgery can be a very serious complication. If you experience unexplained pain or a dramatic increase in pain after surgery, particularly in the legs, there could be an issue with blood clots. It is far better to report the possibility of a blood clot to your care provider than to ignore it and experience a life-threatening issue such as a pulmonary embolism.

After surgery, safe is always better than sorry, especially when blood clots are a possibility.

7 - Aging and thrombosis.

Advanced age is associated with a dramatic increase in the rates of venous and arterial thrombotic events. Increases in fibrinogen, factors VIII and IX, and other coagulation proteins, without a proportional increase in anticoagulant factors, likely contribute to this risk. Recent studies have delineated a role for genomic elements in controlling age-related expression of some coagulation proteins. Enhanced platelet activity as well as molecular and anatomic changes in the vessel wall also contribute to the thrombotic propensity. Advanced age is associated with elevated interleukin-6 (IL-6) and C-reactive protein levels, indicating an inflammatory state that may be an important stimulus

for thrombus formation in the elderly. Despite evidence of a prothrombotic state, many elderly people do not experience clinical thrombotic events. It is possible that the increase in coagulation proteins and activation markers conveys a survival advantage, such as inhibiting tumor angiogenesis. The recent epidemic in obesity may heighten thrombotic risks in the elderly because adipose tissue is an important source of inflammatory cytokines and plasminogen activator inhibitor-1 (PAI-1). As the population ages, further studies will be warranted to define the mechanisms for thrombosis in the elderly.

8 - Family History Associated With Increased Risk Of Blood Clots(7)

Children and siblings of those with venous thrombosis, or blood clots in the veins, appear to have more than double the risk of developing the condition than those without a family history

Venous thrombosis typically begins in leg veins, although the clot may subsequently break off and travel to the lungs. Several genetic risk factors have been identified that increase risk. Carriers of these factors have an additional elevated risk when exposed to an environmental risk factor such as surgical treatment, injury, a period of immobilization or the use of oral contraceptives.

Family history did not correspond well with known genetic risk factors, suggesting that there may be unknown genetic risk factors or that venous thrombosis may cluster in a family due to characteristics of the shared household .

"Both in those with and without genetic or environmental risk factors, family history remained associated with venous thrombosis, The risk increased with the number of factors identified; for those with a genetic and environmental risk factor and a positive family history, the risk was about 64-fold higher than for those with no known risk factor and a negative family history."(7).

9 - Inflammation and Thrombosis – Brothers in Arms (25)

Several interactions occur between inflammation and thrombosis that become more apparent with ageing. It is a two-way process:- inflammation promotes aggregation and coagulation, while activated platelets and coagulation factors or peptides promote inflammation by several mechanisms. Recent evidence

points to the role played by platelets and possibly coagulation factors in the regulation of innate immunity. Physiological anticoagulant pathways also have anti-inflammatory properties. This strong interdependence has an evolutionary origin. Current viewpoints are that inflammation, and thus coagulation, have a role in ageing. 'Inflamm-aging' is a neologism that denotes a low-grade inflammation that accompanies healthy ageing, but can evolve towards excessive inflammation and clotting. It can thus be associated with thrombosis and early death. These fascinating pathophysiological discoveries provide novel targets for the development of new, potentially efficacious antithrombotic drugs.

Inflammation and Platelets

Platelets play a major role in haemostasis: they bind to the exposed subendothelium, even at high shear, expose procoagulant surfaces and secrete vasoactive proaggregants, procoagulant substances and growth factors. Platelets thus participate in amplification of the coagulant response and the formation of stable clots and vessel wall repair. Recent evidence points to platelets being inflammatory cells. The activation of platelets may result in the release of multiple and diverse soluble mediators with pleiotropic functions in inflammation. Chemokines are an example of these mediators; they are responsible for the recruitment of immune cells, lipid mediators and cytokines.

Anti-inflammatory agents have traditionally been commonly used in antithrombotic therapy: both aspirin and heparins possess anti-inflammatory activity. However, aspirin, is often used at antiplatelet dosages that do not elicit an anti-inflammatory effect (i.e. do not inhibit cyclo-oxygenase-2 [COX-2]). Added to this, the anti-inflammatory properties of heparin are exploited mostly in the acute phase of thrombosis, since patients are soon placed on oral anticoagulants.

10 -Medical conditions

Certain physical conditions increase the risk of getting DVT. Each of the following common conditions causes the blood to clot more easily than it normally would:

- Heart Disease, Lung Diseases, Hepatitis, Rheumatoid Arthritis, inflammatory bowel diseases,.....ect . ((most of them have Heart Failure)),

• Cancer (and major cancer treatments)

There are many other medical conditions which are not included in the list above. Some genetic conditions, such as thrombophilia increase the blood's tendency to clot. Anyone who has a family history of DVT should be particularly vigilant about their personal risks and should be aware of the symptoms of thrombosis. Hughes Syndrome (APS) is a rare condition of the immune system which can strike people of any age. Hughes Syndrome can be particularly dangerous for people who are pregnant. Dehydration can cause your blood to thicken, increasing your risk for a blood clot.

Methods

This report raises awareness of a potential source of pulmonary embolism that is rarely considered or detected clinically, and which usually requires postmortem examination for recognition. It also reviews that the possible risk factors for PE.

This study done on(211 persons)" dead cases" were collected from(IRAQ – DIYALA-DIYALA HEALTH FORENSIC MEDICINE DEPARTMENT) ,during aperiod 2015 – 2018.

The cause of death for all was sudden heart attack which show as aresult of pulmonary embolism(PE) "AFTER AUTOPSY".

Results

The information's of study in these following tables.

Table (1) The relationship between gender and dead by pulmonary embolism(PE)

Gender	NO. of dead	%
Males	109	51.65
Females	102	48.35
Total	211	100

Table (2) The relationship between females ages and their dead NO.by (PE)

Females ages/years	NO. of dead	%
2-12	7	6.862
13-20	4	3.921
21-30	19	18.627
31-40	26	25.490
41-50	28	27.450
51-60	12	11.764
60	6	5.882
Total	102	100

Table (3) The relationship between males ages and their dead NO.by (PE)

males ages/years	NO. of dead	%
2-12	4	3.669
13-20	6	5.504
21-30	9	8.256
31-40	18	16.513
41-50	29	26.605
51-60	29	26.605
60	14	12.844
Total	109	100

Table (4) The relationship between times of death and NO. of death by PE.
(most of them dead after 2Am)

Time of death	NO. of death	%
AM	163	77.251
PM	48	22.748
Total	211	100

Table (5) The relationship between risk factors of PE to NO. of females.

(a lot of cases have more than one risk factors)

Risk factors of pulmonary embolism	NO. Of	%
During or after surgery or minor trauma	24	23.529
Inflamations (most of cases have pneumonia)	22	21.568
Over weight	20	19.607
Hormonal birth control	17	16.666
Aging 50 years	16	15.686
Undetected risk factors	10	9.803
Medical conditions (most of them have heart failure)	8	7.843
Sitting for long time	7	6.862
Pregnancy and post normal vaginal delivery	5	4.901
Family history of blood clots	4	3.921
Smoking	4	3.921

Table (6) The relationship between risk factors of PE to NO. of males.

Risk factors of PE	NO. Of	%
Aging 50 years	38	34.862
Smoking	26	23.853
During and after surgery or minor trauma	25	22.935
Inflamations (pneumonia, burn, skin infections...)	17	15.596
Over weight	10	9.174
Family history of blood clots	10	9.174
Medical conditions (most of them heart failure)	9	8.256
Undetected risk factors	7	6.422
Sitting for long period	6	5.504

Table (7) The relationship between NO. of death for males and females during months of year.

Month	NO. of death	%
January	28	13.270
February	15	7.109
March	12	5.687
April	18	8.530
May	7	3.317
June	13	6.161
July	28	13.270
August	18	8.530
September	26	12.322
October	13	6.161
November	8	3.791
December	25	11.848
Total	211	100

Discussion and Conclusion

Pulmonary embolism (PE) is a major international health problem and cause of death. Mortality in untreated PE is approximately 30%(1). Numerous cases are clinically unrecognized, often with fatal outcomes(1).The prevalence of PE at autopsy (approximately 12–15% in hospitalized patients) has not changed over three decades(1).

A contributing factor to the failure to diagnose the disease is that the identification of the source of emboli is often elusive(2).Clinical and autopsy studies have demonstrated the source of thromboemboli in 50–70% of cases.(1) The majority of emboli have been shown to originate in the veins of the legs, frequently at the level of the femoral and iliac veins(1). Upper extremity venous thrombosis and thrombi in the superior vena cava, attributed to invasive procedures, may be associated with PE(1,3,4). Cardiac origin of PE as from right atrial or ventricular thrombi plays only a minor role in the overall incidence of the disease(4,5).Demonstration of pelvic vein thrombosis as the source of pulmonary thromboemboli is rare. Other sources are difficult to identify both clinically and at autopsy because dissection of the veins behind the knees, calves and soles of the feet is not routinely done after mortem. In addition, thrombus detachment can prevent localizing its point of origin. The postmortem examination for thrombosis of deep veins of the lower limbs typically is confined to the palpation of the soles of the feet and manual

compression of the lower extremities with repeated upward compression, “milking,” in an effort to identify premortem clots. This technique may be nonproductive because of inadequate pressure to the leg, particularly in obese patients or because the entire clot may already have migrated. It is therefore important for the autopsy prosector to examine the pelvic,periprostatic venous plexuses for thrombosis(6).

This report raises awareness of a potential source of pulmonary embolism that is rarely considered or detected clinically, and which usually requires postmortem examination for recognition

In my study ;-

1-The prevalence of PE(antemortem thrombus) approximately 5.184% in hospitalized and non hospitalized persons, that dead during (4) years (2015-2018).this percentage is low in compare with other study.(1),that because we have large NO. of death by bullet , shelling injuries which arrived as dead cases immediately after accidents.

2-There are mild difference between males51.65% and females 48.34% in a total number) i.e the same prevalence because that some risk factors present in females but not in males, also some factors more in females than males.(pregnancy,hormonal birth control,cesarianoperations,over weight)

Also the same subject occur with the males. (smoking,aging)

3-A lot of dead cases by PE have more than one risk factors.(pregnant which deliver by cesarian operation, female with overweight and on hormonal birth control..ect.

4- The percentages of risk factors to PE that lead to death (sum of both sexes) were : (Total dead cases by PE were (211)). Males (109), Females (102)

- 1 – Aging (more than 50 years) 28.43%
- 2- During or after surgery or minor trauma 23.22%
- 3- Inflammations 18.48%
- 4 – Over weight 14.21 %
- 5 – smoking 14.21 %
- 6 – Undetected risk factors 8.05 %
- 7 – Medical conditions 8.05 %
(Heart, pulmonary, Liver diseases, Rheumatic arthritis, Cancerect.)
- 8 - -Hormonal birth control 8.05 %
- 9 – Family history of blood clots 6.63 %
- 10-sitting for long periods 6.16%
- 11 – Pregnancy and postnormal vaginal delivery 2.37 %

The highest percentage of dead by PE was Aging group (28.43%) . that may be as a result of over weight, less moving, infections, heart failure, lungs infections and smoking...ect. ;all of these more present in this age group.

The second high percentage was –(During or after surgery or minor trauma 23.22%) that about 1/4 of total number.

This is very important to give care to all post operative or trauma and aware about develop PE specially if the patient has risk factors to blood clots.

Both inflammations cases and medical conditions (26.53%) that predisposed to PE (Heart, pulmonary, Liver diseases, Rheumatic arthritis ,Cancerect.) should give special care to prevent, decrease, treat these cases as early as possible against PE.

The most other important factors predispose to PE are "over weight and sitting for long period " represent about 20.37% of total cases .so should do exercices, walking ,moving and try to decrease over weight. Also prevent and treat bed sore, ulcers, infections.

The smoking(14.21 %) is strong risk factor for PE ,so try to decrease ,stop smoking specially to those have another risk factor.

The hormonal birth control (8.05 %)increase risk for PE , so try to use other way for birth control specially if female has other risk factor.

When female become pregnant (2.37 %) should aware about blood clots and DVT.

Any one has family, personal history of DVT, PE(6.63 %) should visit physician to take medical cares and treat, follow up.

After autopsy there are 8.05% of cases with undetected risk factors " this according to our investigations and autopsy. Also there are a lot of dead cases without any history that predisposed to PE.

Certain Food and Drink Choices Lower Risk of Blood Clots

1-Drink Plenty of Water, Dehydration can cause your blood to thicken, increasing your risk for a blood clot. To make sure you're staying well hydrated, drink at least six to eight 8-ounce glasses of water per day. For a visual gauge, check your urine. If it is a light yellow color or clear, you are probably drinking enough. If it's dark, you're probably not and should increase your daily water intake.

2- Sip Grape Juice, Several studies done at the University of Wisconsin have found substances called flavonoids in purple grapes can help prevent blood clots by making platelets. The research suggests drinking moderate amounts of red wine or purple grape juice. This is in addition to eating five to seven servings of fruits and vegetables per day, as recommended by the American Heart Association.

3-Go for Garlic, People have been using garlic as medicine for thousands of years, dating back to the ancient Egyptians. The odiferous food choice is thought to have many health benefits, one of which is possible blood-thinning properties. Eating garlic regularly may help prevent blood clots. Talk to your doctor about how much garlic you should eat, if you are using blood thinners already. As a natural blood thinner, garlic could interfere with blood-thinning medications you might be taking.

4-Enjoy Virgin Olive Oil, A study published in the American Journal of Clinical Nutrition found that the phenols in virgin olive oil can help prevent blood clots. In the study, people who ate virgin olive oil with a high phenol content had lower levels of a substance

that promotes blood clots. They also had lower levels of a blood clot promoter. So for a DVT food choice, dip your bread in olive oil, the virgin kind.

5-Eat a Kiwi, It's no secret that a diet rich in fruits and vegetables is good for cardiovascular health. But researchers at the University of Oslo revealed a shining star when it comes to DVT food choices, kiwifruit. The study found people who ate two to three kiwi per day had less platelet activity, and therefore, a lower risk of blood clots. Eating kiwi helped lower cholesterol levels, too.

6-Make Leafy Greens a Routine,

If you take warfarin, an anti-coagulant to prevent blood clots, fluctuating amounts of foods high in vitamin K, such as green, leafy vegetables, can interfere with your medication. "Too often, doctors tell patients to avoid all green leaf veggies," Masley said. "Instead, eat leafy greens consistently every day." Have a small salad every day rather than once-in-a-while.

7-Limit Animal Fats in Your Diet, Masley said that the same foods that are bad for cardiovascular health in general can also increase your risk of developing blood clots. That means you want to stay away from unhealthy trans fats, from the saturated fats in full-fat dairy and fatty meats, and from all types of sugar.

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